

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 19 of 31

REMARKS

In the Non-Final Office Action, Examiner Fan objected to and rejected claims 1-30, 33, 35, 36, 38, 42-47, 53, 55-74 and 81 on various grounds. The Applicant responds to each objection and rejection as subsequently recited herein, and respectfully requests reconsideration and further examination of the present application under 37 C.F.R. §1.112:

- A. Examiner Fan rejected claims 6, 11, 12, 19, 24, 25, 49-52, 54, 64-67, and 69 as failing to define each variable in the recited mathematical expressions

The Applicant has amended claims 6, 11, 12, 19, 24, 25, 49-52, 54, 64-67 and 69 herein to define each variable in the recited mathematical expressions. Withdrawal of these objection of claims 6, 11, 12, 19, 24, 25, 49-52, 54, 64-67 and 69 is therefore respectfully requested.

- B. Examiner Fan rejected claims 14-26 and 57-69 under 35 U.S.C. §112, ¶1 as being single means claims

The Applicant has amended independent claim 14 to further recite "at least one antenna for transmitting the transmitted sequence" and independent claim 57 to further recite "at least one antenna for receiving a plurality of receive samples". Withdrawal of the rejection of claims 14-26 and 57-69 under 35 USC §112, ¶1 as being single means claims is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 20 of 31

- C. Examiner Fan rejected claims 29, 30, 33, 35, 36 and 38 under 35 U.S.C. §101 as being directed to non-statutory subject matter

The Applicant has amended independent claim 29 to further recite "computer readable code for transmitting the sequence" to further clarify the subject matter of claims 29, 30, 33, 35, 36, and 38. Withdrawal of the rejection of claims 29, 30, 33, 35, 36, and 38 under 35 USC §101 as being directed to non-statutory subject matter is therefore respectfully requested.

- D. Examiner Fan rejected claims 1-6, 8, 12, 14-19, 21, 25, 27 and 28 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,373,861 B1 to *Lee*

The Applicant has thoroughly considered Examiner Fan's remarks concerning the patentability of claims 1-6, 8, 12, 14-19, 21, 25, 27 and 28 over *Lee*. The Applicant has also thoroughly read *Lee*. The Applicant respectfully asserts that *Lee* fails to teach or suggest "providing at least one spread sequence portion in parallel" and "forming a transmitted sequence based on an arrangement of the spread sequence portion in parallel and the cyclic redundancy" as recited in amended independent claim 1; and "a transmitting device to form a transmitted sequence based on an arrangement of a spread sequence in parallel and a cyclic redundancy" as recited in amended independent claim 14. Specifically, as shown in FIG. 1, *Lee* teaches a parallel-to-serial converter 105 that inserts a guard interval after a parallel-to-serial conversion of a sub-carriers provided by a IFFT device 104. See, Lee at column 2, lines 1-36.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 21 of 31

Withdrawal of the rejection of independent claims 1 and 14 under 35 USC §102(e) as being anticipated by *Lee* is therefore respectfully requested.

Claims 2-6, 8 and 12 depend from independent claim 1. Therefore, dependent claims 2-6, 8 and 12 include all of the elements of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claims 2-6, 8 and 12 are allowable over *Lee* for at least the same reasons as set forth with respect to independent claim 1 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claims 2-6, 8 and 12 under 35 USC §102(e) as by anticipated by *Lee* is therefore respectfully requested.

Claims 15-19, 21, 25, 27 and 28 depend from independent claim 14. Therefore, dependent claims 15-19, 21, 25, 27 and 28 include all of the elements of independent claim 14. It is therefore respectfully submitted by the Applicant that dependent claims 15-19, 21, 25, 27 and 28 are allowable over *Lee* for at least the same reasons as set forth with respect to independent claim 14 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claims 15-19, 21, 25, 27 and 28 under 35 USC §102(e) as by anticipated by *Lee* is therefore respectfully requested.

- E. Examiner Fan rejected claims 42-44, 47, 53, 55-59, 62, 68, 70-72 and 81 under 35 U.S.C. §102(b) as being anticipated by "The Performance Evaluation of the Multi-Carrier CDMA System with Frequency Domain Equalization", IEEE Paper, Sept. 1999 to *Xing* et al.

The Applicant has thoroughly considered Examiner Fan's remarks concerning the patentability of claims 42-44, 47, 53, 55-59, 62, 68, 70-72 and 81 over *Xing*. The Applicant has also thoroughly read *Xing*. The Applicant respectfully asserts that *Xing* fails to teach or suggest "determining a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 22 of 31

in amended independent claim 42; "means for determining a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 55; to determine a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 57; and computer readable code for determining a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 70. The aforementioned added limitations of independent claims 42, 55, 57, and 70 are derived from the allowable subject matter of claim 48.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 23 of 31

Withdrawal of the rejection of independent claims 42, 55, 57, and 70 under 35 USC §102(b) as being anticipated by *Xing* is therefore respectfully requested.

Claims 43, 44, 47 and 53 depend from independent claim 42. Therefore, dependent claims 43, 44, 47 and 53 include all of the elements of independent claim 42. It is therefore respectfully submitted by the Applicant that dependent claims 43, 44, 47 and 53 are allowable over *Xing* for at least the same reasons as set forth with respect to independent claim 42 being allowable over *Xing*. Therefore, withdrawal of the rejection of dependent claims 43, 44, 47 and 53 under 35 USC §102(b) as by anticipated by *Xing* is therefore respectfully requested.

Claim 56 depends from independent claim 55. Therefore, dependent claim 56 includes all of the elements of independent claim 55. It is therefore respectfully submitted by the Applicant that dependent claim 56 is allowable over *Xing* for at least the same reasons as set forth with respect to independent claim 55 being allowable over *Xing*. Therefore, withdrawal of the rejection of dependent claim 56 under 35 USC §102(b) as by anticipated by *Xing* is therefore respectfully requested.

Claims 58, 59, 62 and 68 depend from independent claim 57. Therefore, dependent claims 58, 59, 62 and 68 include all of the elements of independent claim 57. It is therefore respectfully submitted by the Applicant that dependent claims 58, 59, 62 and 68 are allowable over *Xing* for at least the same reasons as set forth with respect to independent claim 57 being allowable over *Xing*. Therefore, withdrawal of the rejection of dependent claims 58, 59, 62 and 68 under 35 USC §102(b) as by anticipated by *Xing* is therefore respectfully requested.

Claims 71, 72 and 81 depend from independent claim 70. Therefore, dependent claims 71, 72 and 81 include all of the elements of independent claim 70. It is therefore respectfully submitted by the Applicant that dependent claims 71, 72 and 81 are allowable over *Xing* for at least the same reasons as set forth with respect to independent claim 70 being allowable over *Xing*. Therefore, withdrawal of the rejection of dependent claims 71, 72 and 81 under 35 USC §102(b) as by anticipated by *Xing* is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 24 of 31

- F. Examiner Fan rejected claims 42, 43, 46, 47, 55-58, 61, 62, 70, 71 and 74 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,719,899 to *Thielecke et al.*

The Applicant has thoroughly considered Examiner Fan's remarks concerning the patentability of claims 42, 43, 46, 47, 55-58, 61, 62, 70, 71 and 74 over *Thielecke*. The Applicant has also thoroughly read *Thielecke*. The Applicant respectfully asserts that *Thielecke* fails to teach or suggest "determining a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 42; "means for determining a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 55; to determine a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 57; and computer readable code for determining a plurality of frequency domain equalization weights for the frequency domain samples, wherein the frequency domain equalization weights are determined based on at least one of a power weight, a plurality of frequency domain channel estimates, at least one noise power, at least one interference power, and at least one noise plus interference power" as recited in amended independent claim 70. The aforementioned added limitations of independent claims 42, 55, 57, and 70 are derived from the allowable subject matter of claim 48.

Withdrawal of the rejection of independent claims 42, 55, 57, and 70 under 35 USC §102(b) as being anticipated by *Thielecke* is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 25 of 31

Claims 43, 46 and 47 depend from independent claim 42. Therefore, dependent claims 43, 46 and 47 include all of the elements of independent claim 42. It is therefore respectfully submitted by the Applicant that dependent claims 43, 46 and 47 are allowable over *Thielecke* for at least the same reasons as set forth with respect to independent claim 42 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claims 43, 46 and 47 under 35 USC §102(b) as by anticipated by *Thielecke* is therefore respectfully requested.

Claim 56 depends from independent claim 55. Therefore, dependent claim 56 includes all of the elements of independent claim 55. It is therefore respectfully submitted by the Applicant that dependent claim 56 is allowable over *Thielecke* for at least the same reasons as set forth with respect to independent claim 55 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claim 56 under 35 USC §102(b) as by anticipated by *Thielecke* is therefore respectfully requested.

Claims 58, 61 and 62 depend from independent claim 57. Therefore, dependent claims 58, 61 and 62 include all of the elements of independent claim 57. It is therefore respectfully submitted by the Applicant that dependent claims 58, 61 and 62 are allowable over *Thielecke* for at least the same reasons as set forth with respect to independent claim 57 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claims 58, 61 and 62 under 35 USC §102(b) as by anticipated by *Thielecke* is therefore respectfully requested.

Claims 71 and 74 depend from independent claim 70. Therefore, dependent claims 71 and 74 include all of the elements of independent claim 70. It is therefore respectfully submitted by the Applicant that dependent claims 71 and 74 are allowable over *Thielecke* for at least the same reasons as set forth with respect to independent claim 70 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claims 71 and 74 under 35 USC §102(b) as by anticipated by *Thielecke* is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 26 of 31

- G. Examiner Fan rejected claims 7 and 20 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,373,861 to *Lee* in view of U.S. Patent No. 5,960,032 to *Letaief et al.*

Claim 7 depends from independent claim 1. Therefore, dependent claim 7 includes all of the elements of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claim 7 is allowable over *Lee* in view of *Letaief* for at least the same reasons as set forth with respect to independent claim 1 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claim 7 under 35 USC §103(a) as by unpatentable over *Lee* in view of *Letaief* is therefore respectfully requested.

Claim 20 depends from independent claim 14. Therefore, dependent claim 20 includes all of the elements of independent claim 14. It is therefore respectfully submitted by the Applicant that dependent claim 20 is allowable over *Lee* in view of *Letaief* for at least the same reasons as set forth with respect to independent claim 14 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claim 20 under 35 USC §103(a) as by unpatentable over *Lee* in view of *Letaief* is therefore respectfully requested.

- H. Examiner Fan rejected claims 9, 10, 22 and 23 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,373,861 to *Lee* in view of U.S. Patent No. 5,960,032 to *Thomas et al.*

Claims 9 and 10 depend from independent claim 1. Therefore, dependent claims 9 and 10 include all of the elements of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claims 9 and 10 are allowable over *Lee* in view of *Thomas* for at least the same reasons as set forth with respect to independent claim 1 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claims 9 and 10 under 35 USC §103(a) as by unpatentable over *Lee* in view of *Thomas* is therefore respectfully requested.

Claims 22 and 23 depend from independent claim 14. Therefore, dependent claims 22 and 23 include all of the elements of independent claim 14. It is therefore respectfully submitted by the Applicant that dependent claims 22 and 23 are allowable over *Lee* in view of *Thomas* for

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 27 of 31

at least the same reasons as set forth with respect to independent claim 14 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claims 22 and 23 under 35 USC §103(a) as by unpatentable over *Lee* in view of *Thomas* is therefore respectfully requested.

- I. Examiner Fan rejected claims 11, 13, 24 and 26 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,373,861 to *Lee* in view of U.S. Patent No. 6,449,246 to *Barton et al.*

Claims 11 and 13 depend from independent claim 1. Therefore, dependent claims 11 and 13 include all of the elements of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claims 11 and 13 are allowable over *Lee* in view of *Barton* for at least the same reasons as set forth with respect to independent claim 1 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claims 11 and 13 under 35 USC §103(a) as by unpatentable over *Lee* in view of *Barton* is therefore respectfully requested.

Claims 24 and 26 depend from independent claim 14. Therefore, dependent claims 24 and 26 include all of the elements of independent claim 14. It is therefore respectfully submitted by the Applicant that dependent claims 24 and 26 are allowable over *Lee* in view of *Barton* for at least the same reasons as set forth with respect to independent claim 14 being allowable over *Lee*. Therefore, withdrawal of the rejection of dependent claims 24 and 26 under 35 USC §103(a) as by unpatentable over *Lee* in view of *Barton* is therefore respectfully requested.

- J. Examiner Fan rejected claims 29, 30, 33 and 36 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,719,899 to *Lee et al.* in view of "A Programmable Architecture for OFDM-CDMA", IEEE paper to *Chen et al.*

The Applicant has thoroughly considered Examiner Fan's remarks concerning the patentability of claims 29, 30, 33 and 36 over *Lee* in view of *Chen*. The Applicant has also thoroughly read *Lee* in view of *Chen*. The Applicant respectfully asserts that *Lee* in view of *Chen* fails to teach or suggest "computer readable code for forming a sequence based on an arrangement of a cyclic redundancy and at least one spread sequence portion in parallel" as recited in amended independent claim 29. Specifically, as shown in FIG. 1, *Lee* teaches a

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 28 of 31

parallel-to-serial converter 105 that inserts a guard interval after a parallel-to-serial conversion of a sub-carriers provided by a IFFT device 104. See, Lee at column 2, lines 1-36. Furthermore, *Chen* fails to teach or suggest a modification of *Lee* to inserts a guard interval prior to a parallel-to-serial conversion of a sub-carriers provided by a IFFT device 104.

Withdrawal of the rejection of independent claim 29 under 35 USC §103(a) as being unpatentable over *Lee* in view of *Chen* is therefore respectfully requested.

Claims 30, 33 and 36 depend from independent claim 29. Therefore, dependent claims 30, 33 and 36 include all of the elements of independent claim 29. It is therefore respectfully submitted by the Applicant that dependent claims 30, 33 and 36 are allowable over *Lee* in view of *Chen* for at least the same reasons as set forth with respect to independent claim 29 being allowable over *Lee* in view of *Chen*. Therefore, withdrawal of the rejection of dependent claims 30, 33 and 36 under 35 USC §102(b) as by anticipated by *Lee* in view of *Chen* is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 29 of 31

- K. Examiner Fan rejected claim 35 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,719,899 to *Lee et al.* in view of "A Programmable Architecture for OFDM-CDMA", IEEE paper to *Chen et al.* and in further view of U.S. Patent no. 5,960,032 to *Letaief et al.*

Claim 35 depends from independent claim 29. Therefore, dependent claim 35 includes all of the elements of independent claim 29. It is therefore respectfully submitted by the Applicant that dependent claim 35 is allowable over *Lee* in view of *Chen* and in further view of *Letaief* for at least the same reasons as set forth with respect to independent claim 29 being allowable over *Lee* in view of *Chen*. Therefore, withdrawal of the rejection of dependent claim 35 under 35 USC §102(b) as by anticipated by *Lee* in view of *Chen* and in further view of *Letaief* is therefore respectfully requested.

- L. Examiner Fan rejected claim 38 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,719,899 to *Lee et al.* in view of "A Programmable Architecture for OFDM-CDMA", IEEE paper to *Chen et al.* and in further view of U.S. Patent no. 6,826,240 to *Thomas et al.*

Claim 38 depends from independent claim 29. Therefore, dependent claim 38 includes all of the elements of independent claim 29. It is therefore respectfully submitted by the Applicant that dependent claim 38 is allowable over *Lee* in view of *Chen* and in further view of *Thomas* for at least the same reasons as set forth with respect to independent claim 29 being allowable over *Lee* in view of *Chen*. Therefore, withdrawal of the rejection of dependent claim 38 under 35 USC §102(b) as by anticipated by *Lee* in view of *Chen* and in further view of *Thomas* is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 30 of 31

- M. Examiner Fan rejected claims 44, 45, 59, 60, 72 and 73 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,719,899 to *Thielecke* et al. in view U.S. Patent No. 6,279,022 to *Miao* et al.

Claims 44 and 45 depend from independent claim 42. Therefore, dependent claims 44 and 45 include all of the elements of independent claim 42. It is therefore respectfully submitted by the Applicant that dependent claims 44 and 45 are allowable over *Thielecke* in view of *Miao* for at least the same reasons as set forth with respect to independent claim 42 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claims 44 and 45 under 35 USC §103(a) as by unpatentable over *Thielecke* in view of *Miao* is therefore respectfully requested.

Claims 59 and 60 depend from independent claim 57. Therefore, dependent claims 59 and 60 include all of the elements of independent claim 57. It is therefore respectfully submitted by the Applicant that dependent claims 59 and 60 are allowable over *Thielecke* in view of *Miao* for at least the same reasons as set forth with respect to independent claim 57 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claims 59 and 60 under 35 USC §103(a) as by unpatentable over *Thielecke* in view of *Miao* is therefore respectfully requested.

Claims 72 and 73 depend from independent claim 70. Therefore, dependent claims 72 and 73 include all of the elements of independent claim 70. It is therefore respectfully submitted by the Applicant that dependent claims 72 and 73 are allowable over *Thielecke* in view of *Miao* for at least the same reasons as set forth with respect to independent claim 70 being allowable over *Thielecke*. Therefore, withdrawal of the rejection of dependent claims 72 and 73 under 35 USC §103(a) as by unpatentable over *Thielecke* in view of *Miao* is therefore respectfully requested.

February 21, 2006
Case No. CR00262M (9640/50)
Serial No.: 09/903,175
Filed: July 11, 2001
Page 31 of 31


SUMMARY

The Applicant respectfully submits that the pending claims as listed herein fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112. In view of the foregoing, favorable consideration and early passage to issue of the present application is respectfully requested. If any points remain in issue that may best be resolved through a personal or telephonic interview, Examiner Fan is respectfully requested to contact the undersigned at the telephone number listed below.

Dated: **February 21, 2006**

Respectfully submitted,
Kevin Baum

CARDINAL LAW GROUP
Suite 2000
1603 Orrington Avenue
Evanston, Illinois 60201
Phone: (847) 905-7111
Fax: (847) 905-7113



Frank C. Nicholas
Registration No. 33,983
Attorney for Applicant